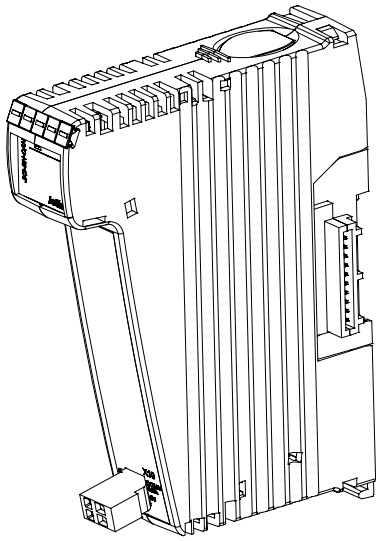
# JX3-PS1

## Power Supply Module



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## User Manual

Jetter
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**Assignment to product**

This User Manual is an integral part of JX3-PS1:

| | |
|---|---|
| Type: | |
| Serial #: | |
| Year of construction: | |
| Order #: | |

CE

To be entered by the customer:

| | |
|---|---|
| Inventory #: | |
| Place of operation: | |

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**Significance**

Significance of the User Manual

The User Manual is an integral part des JX3-PS1:

- It must be kept in a way that it is always at hand, until the JX3-PS1 will be disposed of.
- If the JX3-PS1 is sold or loaned/leased out, the User Manual has to be passed on.

In any case you encounter difficulties to clearly understand this User Manual, please contact the manufacturer.

We would appreciate any suggestions and contributions on your part and would ask you to contact us by our e-mail address info@jetter.de. This will help us to produce manuals that are more user-friendly and to address your wishes and requirements.

This User Manual contains important information on how to transport, erect, install, operate, maintain and repair the JX3-PS1.

Therefore, the persons carrying out these jobs must carefully read, understand and observe this User Manual, and especially the safety instructions.

Missing or inadequate knowledge of the User Manual results in the loss of any claim of liability on part of Jetter AG. Therefore, the operating company is recommended to have the instruction of the persons concerned confirmed in writing.

# Hazard Levels

**Introduction**

This topic describes the safety labels and hazard levels used in this manual.

**Safety Labels**

Signs using this symbol are to warn you of inuries or even death. It is imperative to follow the instructions to prevent hazards.

**Hazard Levels**

Safety information is classified into the following hazard levels:

| Hazard Level | Consequences | Probability |
|---|---|---|
| DANGER | Death/severe injury (irreversible) | The hazard is imminent |
| WARNING | Death/severe injury (irreversible) | Potential occurrence |
| CAUTION | Slight injury (reversible) | Potential occurrence |
| CAUTION | Material damage | Potential occurrence |

# Table of Contents

Hazard Levels ..... 5

**1 Safety Instructions 9**

Generally Valid Safety Instructions ..... 10
Ensure Your Own Safety ..... 12
Instructions on EMI ..... 13

**2 Engineering 15**

Product Description – JX3-PS1 Module ..... 16
Parts and Interfaces of the Module ..... 17
List of Documentation ..... 18
Physical Dimensions ..... 19
Terminal Assignment X10 ..... 20
Connector Specification of X10 Terminal ..... 21
LED of the Module ..... 22
Engineering of a JX3 Station equipped with JC-3xx ..... 23
Engineering of a JX3 Station equipped with JX3-BN-ETH ..... 24
Engineering of a JX3 Station equipped with JX3-BN-CAN ..... 25
Limitations to be Taken Into Account When Engineering a JX3 Station ..... 26

**3 Locating Faults 29**

LED of the Module ..... 30
Voltage is not OK ..... 31

**4 Identifying the Module 33**

Identification via nameplate ..... 34

**Appendix 35**

**A: Technical Data ..... 36**
Technical Data ..... 37
Physical Dimensions ..... 38
Operating Parameters: Environment and Mechanics ..... 39
Operating Parameters: Enclosure ..... 40
DC Power Supply Inputs and Outputs ..... 41
Shielded Data and I/O Lines ..... 42
**B: Index ..... 43**

# 1 Safety Instructions

**Introduction**

This chapter informs the user of general safety instructions and warns of residual dangers, if applicable. Furthermore, it contains information on EMC.

**Contents**

This chapter contains the following topics:


| Topic | Page |
|---|---|
| Generally Valid Safety Instructions | 10 |
| Ensure Your Own Safety | 12 |
| Instructions on EMI | 13 |

## Generally Valid Safety Instructions

**Introduction**

This device complies with the valid safety regulations and standards. Special emphasis was given to the safety of the users.

Of course, the user should adhere to the following regulations:

- relevant accident prevention regulations;
- accepted safety rules;
- EC guidelines and other country-specific regulations

**Intended Conditions of Use**

Usage according to the intended conditions of use includes operation in accordance with this User Manual.

The JX3-PS1 module provides power supply of up to 8 JX3 expansion modules. This module is required if more than 8 JX3 expansion modules are connected to a JX3 bus head or to a controller of the JetControl 300 series.

It can be connected to the JX3 backplane bus. The JX3 backplane bus starts at the JX3-BN-xxx module or at the JC-3xx controller.

The operating voltage of the JX3-PS1 is DC 24 V. This operating voltage is classified as SELV (Safety Extra Low Voltage).

Therefore, the JX3-PS1 is not subject to the EU Low Voltage Directive.

The JX3-PS1 module may only be operated within the limits of the stated data, see **chapter Technical Data** on page 37.

**Usage Other than Intended**

This device must not be used in technical systems which to a high degree have to be fail-safe, e. g. ropeways and aeroplanes.

If the device is to be run under ambient conditions which differ from the conditions mentioned in chapter **Operating Condition** on page 39, the manufacturer is to be contacted beforehand.

**Who may Operate the Device?**

Only instructed, trained and authorized persons are permitted to operate this device.

| | |
|---|---|
| **Transport:** | Only by personnel with knowledge in handling electrostatically sensitive components. |
| **Installation:** | Only by specialists with training in electrical engineering. |
| **Engineering:** | Only by trained personnel, as specific know-how of electrical engineering is required. |
| **Commissioning:** | Only by specialists with profound knowledge of, and experience with, electrical engineering / drive technology. |

**Modifications and Alterations to the Device**

**For safety reasons, no modifications and changes to the device and its functions are permitted.**

Any modifications to the device not expressly authorized by the manufacturer will result in a loss of any liability claims to Jetter AG.

| | |
|---|---|
| | **The original parts are specifically designed for the device. Parts and equipment from other manufacturers are not tested on our part, and are, therefore, not released by Jetter AG.**<br>The installation of such parts may impair the safety and the proper functioning of the device.<br><br>Any liability on the part of Jetter AG for any damages resulting from the use of non original parts and equipment is excluded. |
| **Repair and Maintenance** | This device must not be repaired by the operators themselves. The device does not contain any parts that could be repaired by the operator.<br>The device must be sent to Jetter AG for repair. |
| **Decommissioning and Disposal** | The environmental regulations of the respective country must be complied with when decommissioning and disposing of devices on the operating company's premises. |
| **Transporting JX3 Modules** | To exclude damages to JX3 modules the JX3 backplane bus has to be attached during transport. This is particularly true for transport via mail. |
| **Replacing Modules** | During exchange of JX3 modules, class of protection IP20 is not ensured. Do not touch any electronic components once the JX3 module enclosure has been removed from the JX3 backplane module.<br>Touching the EMC clip may result in damages to this clip and, thus, in lower noise immunity. |

## Ensure Your Own Safety

**Caution**

Follow this procedure in order to ensure your own safety:

| Measures | Action |
|---|---|
| **1** | Isolate the device from the mains, if maintenance works have to be carried out. By doing so, you will prevent accidents resulting from electric voltage and moving parts. |
| **2** | Safety and protective devices, e.g. the barrier and cover of the terminal box must never be shunted or by-passed. |
| **3** | Dismantled protective equipment, such as guards, must be reattached prior to commissioning and checked for proper functioning. |
| **4** | Prior to commissioning, the machine manufacturer shall conduct a hazard analysis for the machine and take appropriate measures to prevent personal injury and damage to property resulting from accidental movements. |

**Malfunctions or Other Damages**

Follow this procedure in the case of malfunctions or damages:

| Measures | Action |
|---|---|
| **1** | **Immediately separate the device from the mains.** |
| **2** | The device must be protected from improper or inadvertent use. |
| **3** | Malfunctions or other damages are to be reported to a responsible person at once. |

**Information Signs and Labels**

Markings, information signs, and labels always have to be observed and kept readable.

Damaged or unreadable information signs and labels have to be replaced.

## Instructions on EMI

**Noise Immunity of a System**

The noise immunity of a system is determined by the weakest component of the system. For this reason, correct wiring and shielding of cables is of paramount importance.

**Measures to be Taken**

Measures for increasing immunity against EMI in electric plants:

- The JX3-PS1 module has to be attached to a DIN rail acc. to EN 50022-35 x 7.5.
- Follow the instructions given in Application Note 016 "EMC-Compatible Installation of the Electric Cabinet" published by Jetter AG.

**The following instructions are excerpts from Application Note 016:**

- On principle, **physical separation** should be maintained between signal and power lines. We recommend spacings greater than 20 cm. Cables and lines should cross each other at an angle of 90°.
- The following line cables must be shielded:
  Analog lines, data lines, motor cables coming from inverter drives (servo output stage, frequency converter), lines between components and interference suppressor filter, if the suppressor filter has not been placed at the component directly.
- Shield cables **at both ends**.
- Unshielded wire ends of shielded cables should be as short as possible.
- The entire shield **must**, in its entire perimeter, be drawn behind the isolation, and then be clamped under an earthed strain relief **with the greatest possible surface area**.

**Download of Application Note 016**

You can download Application Note 016 from our **homepage** http://www.jetter.de. The path leading to Application Note 016 "EMC-Compatible Installation of Electric Cabinets" is "Industrial Automation - Support - Downloads - Miscellaneous - Application Notes".

# 2 Engineering

**Purpose of this Chapter**

This chapter is for supporting you when engineering a plant equipped with the JX3-PS1 module in the following fields of activity:

- Wiring of a JX3 station
- Commissioning of a JX3 station in an electric cabinet

**Contents**

This chapter contains the following topics:


| Topic | Page |
|---|---|
| Product Description – JX3-PS1 Module | 16 |
| Parts and Interfaces of the Module | 17 |
| List of Documentation | 18 |
| Physical Dimensions | 19 |
| Terminal Assignment X10 | 20 |
| Connector Specification of X10 Terminal | 21 |
| LED of the Module | 22 |
| Engineering of a JX3 Station equipped with JC-3xx | 23 |
| Engineering of a JX3 Station equipped with JX3-BN-ETH | 24 |
| Engineering of a JX3 Station equipped with JX3-BN-CAN | 25 |
| Limitations to be Taken Into Account When Engineering a JX3 Station | 26 |

# Product Description – JX3-PS1 Module

**The JX3-PS1 Module**

The JX3-PS1 module provides power supply of up to 8 JX3 peripheral modules. This module is required if more than 8 JX3 peripheral modules are connected to a JX3 bus head or to a controller of the JetControl 300 series.

**Characteristics**

The following list shows the characteristics of this module:

- Power supply for up to 8 JX3 peripheral modules
- For operation along with all JX3 bus heads and controllers of the JetControl 300 series
- Expansion of a JX3 station to up to 16 JX3 peripheral modules
- Color of LED sheeting: light grey (RAL 7035)

**Scope of Delivery**

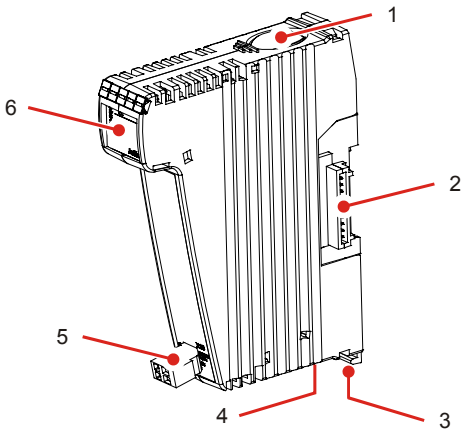
The following items are included in the scope of delivery of the JX3-PS1 module:

| Article # | Quantity | Description |
|---|---|---|
| 10000542 | 1 | JX3-PS1 |
| 60870409 | 1 | 2-pin connector, spring cage technology |
| 60870411 | 10 | Terminal labels |
| 60871940 | 1 | Installation Instructions |

# Parts and Interfaces of the Module

**Parts and Interfaces**

The JX3-PS1 module features the following parts and interfaces:




| Number | Part | Function |
|---|---|---|
| **1** | Upper latch | For removing the JX3 module enclosure from the JX3 backplane module. |
| **2** | X119 | Connector for additional JX3 modules |
| **3** | Release lever | For removing the JX3 module from the DIN rail. |
| **4** | Lower latch | For removing the JX3 module enclosure from the JX3 backplane module.<br>Not visible in illustration. |
| **5** | Terminal X10 | Power supply connector for JX3 peripheral modules to be supplied |
| **6** | LED | Diagnostic and status LED |

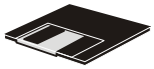
# List of Documentation

**Introduction**

Various documents and software tools will support the user when engineering and installing the JX3-PS1 module. These documents and software tools can be downloaded from our **homepage** http://www.jetter.de.

**Engineering**

When performing engineering tasks, the following documents and software tools will support you:

| | |
|---|---|
| | **Data Sheet on the module JX3-PS1** |
| | ■ Product Description |
| | ■ Technical Data |
| | ■ Dimensional Drawings |
| | **User Manual on the module JX3-PS1** |
| | ■ the document at hand |
|  | **Drawings of the module JX3-PS1** |
| | ■ 3D data (stp file) |
| | ■ 2D data (dxf file) |
| | **JX3-I/O System - User Information** |
| | ■ Upgrading from JX2 to JX3 |
| | ■ Accessories for the JX3 System |
| | ■ Dimensional Drawings |
| | ■ Engineering of a JX3 station |
| | ■ Installing and removing a JX3 station |
| | ■ Connectors for JX3 modules |
| | ■ Product descriptions on JX3 Modules |

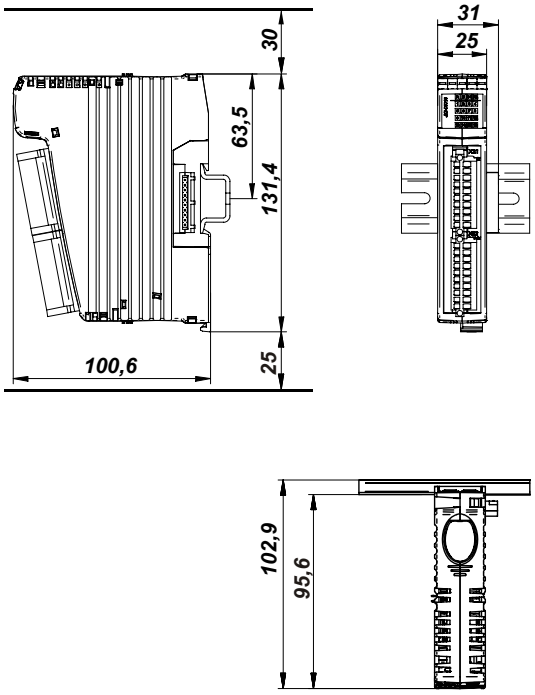
**Installation**

When installing such modules, the following document will support you:

| | |
|---|---|
| | **Installation Instructions** |
| | It is included in the boxed module JX3-PS1 and contains information on the following items: |
| | ■ installation of the module on a DIN rail |
| | ■ terminal assignment |
| | ■ specification of conductor terminals |
| | ■ diagnostics using LED |

# Physical Dimensions

### Physical Dimensions




### Minimum Clearances

At mounting the JX3-PS1 module, make sure to maintain a minimum clearance above and below. At replacing the module, you can operate the locking mechanisms of the JX3 backplane module using your fingers.

- Minimum clearance above: 30 mm
- Minimum clearance below: 25 mm

### Module Width

The JX3-PS1 module requires a space of 31 mm width. At connecting the JX3-PS1 module to a JX3 station, the width is increased by 25 mm.

### Mounting Position

The mounting position of the JX3-PS1 module is vertical.

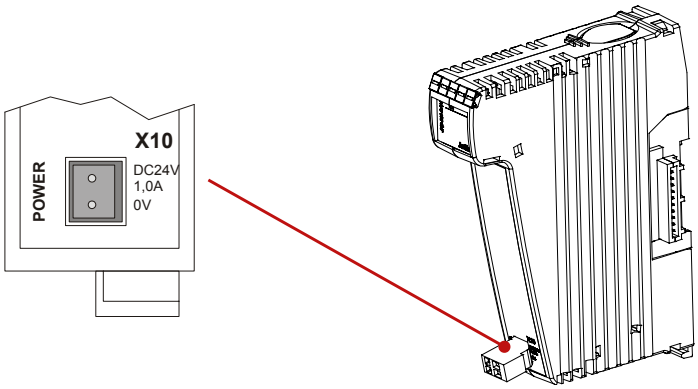
# Terminal Assignment X10

**Terminal Interface**

The following power supply is connected to the terminal X10:

- Power supply for up to 8 JX3 peripheral modules which have been installed to the right of the JX3-PS1 module.

**Terminal Assignment**

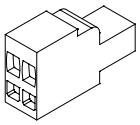



| Terminal point | Function |
|---|---|
| **DC 24 V, 1.0 A** | Supply voltage for connected JX3 peripheral modules |
| **0 V** | Reference potential |

# Connector Specification of X10 Terminal

**Order Data - Connector**

A 2-pole connector is included in the scope of delivery of the JX3-PS1 module: This connector can be ordered separately using the following order data:



| | |
|---|---|
| Designation | BU_02_E_BLZF_GE_RM3.5 |
| Article # | 60870409 |

**Connector Specification**

For information on connector specification refer to the following list:

| **Connector Specification** | |
|---|---|
| Connector technology | Spring cage connection |
| Type | 2 poles, 3.5 mm contact spacing |
| **Connectable conductors** | |
| Outer diameter of insulation | max. 2.90 mm |
| AWG | 16 ... 28 |
| Capacity of terminals | 0.13 ... 1.5 $mm^2$ |
| Stripping length | 10 mm |
| **Specification without wire end ferrules** | |
| Solid conductor H05(07) V-U | 0.2 ... 1.5 $mm^2$ |
| Finely stranded conductor H05(07) V-K | 0.2 ... 1.5 $mm^2$ |
| **Specification with wire end ferrules** | |
| Wire end ferrule without collar to DIN 46228/1 | 0.2 ... 1.5 $mm^2$ |
| Wire end ferrule with collar to DIN 46228/4 | 0.2 ... 1.5 $mm^2$ |
| Crimping tool to DIN 46228 | PZ 4, PZ 6 ROTO, PZ 6/5 |

**Screw Driver**

The fitting screw driver can be ordered from Jetter AG directly.

| | |
|---|---|
| Type | SD 0.4 x 2.5 - DIN 5264-A |
| Designation | DIV_SCHRAUBENDREHER_2,5*75 |
| Article # | 60871712 |

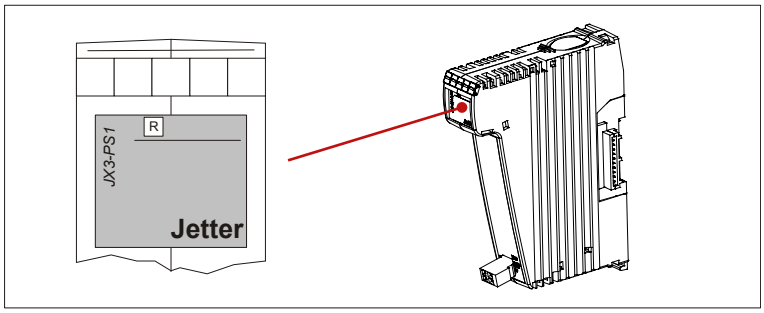
# LED of the Module

**Introduction**

The JX3-PS1 module signals via LED whether the logic voltage supply for connected JX3 peripheral modules is faultless. This feature allows the user to directly locate a fault.

**LED of the Module**

The JX3-PS1 module is equipped with an LED which indicates the condition of the supply voltage.




| Element | Status | Function |
|---|---|---|
| "R" LED | Off | Logic voltage supply for connected JX3 peripheral modules is not OK |
| | Green, lit | Logic voltage supply for connected JX3 peripheral modules is OK |

# Engineering of a JX3 Station equipped with JC-3xx

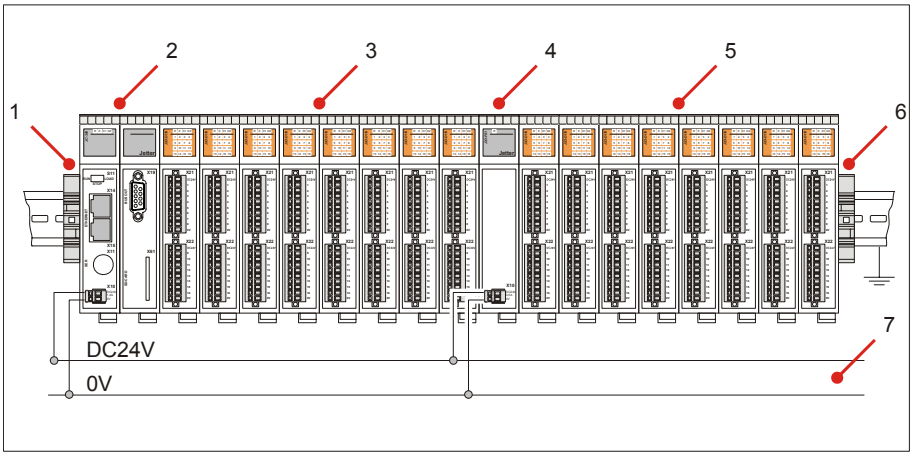
**Engineering Rules for a JX3 Station**

When engineering a JX3 station, follow the rules listed below:

- Up to 8 JX3 peripheral modules can directly be connected to a JC-3xx controller.
- Before the ninth JX3 peripheral module, a JX3-PS1 power supply module must be inserted.
- To a JX3-PS1 power supply module up to 8 more JX3 peripheral modules can be connected.

**Fully Equipped JX3 Station**

The following illustration shows a JX3 station with a JC-3xx controller and 16 JX3 peripheral modules. Downstream the eighth JX3 peripheral module a JX3-PS1 power supply module has been inserted.




| Number | Element | Function |
|---|---|---|
| **1** | End clamp for DIN rail | For securing JX3 modules on the DIN rail |
| **2** | JC-3xx | Controller and power supply for the first 8 JX3 peripheral modules |
| **3** | JX3-DI16 | 8 JX3 peripheral modules |
| **4** | JX3-PS1 | Power supply module for the next 8 JX3 peripheral modules |
| **5** | JX3-DI16 | 8 JX3 peripheral modules |
| **6** | End clamp for DIN rail | For securing JX3 modules on the DIN rail |
| **7** | Voltage supply lines DC24V and 0V | Logic voltage supply for all modules of the JX3 station |

**Related Topics**

- **Limitations to be taken into account when engineering a JX3 station** on page 26

# Engineering of a JX3 Station equipped with JX3-BN-ETH

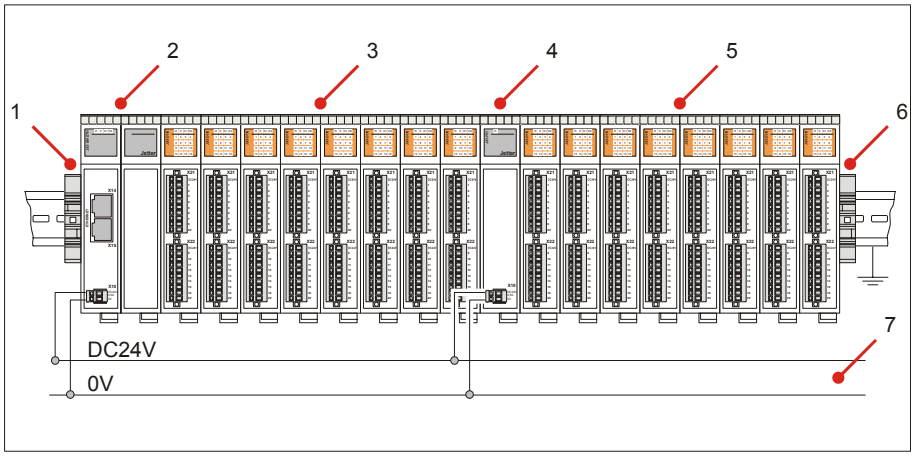
**Engineering Rules for a JX3 Station**

When engineering a JX3 station, follow the rules listed below:

- Up to 8 JX3 peripheral modules can directly be connected to a JX3-BN-ETH bus head.
- Before the ninth JX3 peripheral module, a JX3-PS1 power supply module must be inserted.
- To a JX3-PS1 power supply module up to 8 more JX3 peripheral modules can be connected.

**Fully Equipped JX3 Station**

The following illustration shows a JX3 station with a JX3-BN-ETH bus head and 16 JX3 peripheral modules. Downstream the eighth JX3 peripheral module a JX3-PS1 power supply module has been inserted.




| Number | Element | Function |
|---|---|---|
| **1** | End clamp for DIN rail | For securing JX3 modules on the DIN rail |
| **2** | JX3-BN-ETH | Bus head and power supply for the first 8 JX3 peripheral modules |
| **3** | JX3-DI16 | 8 JX3 peripheral modules |
| **4** | JX3-PS1 | Power supply module for the next 8 JX3 peripheral modules |
| **5** | JX3-DI16 | 8 JX3 peripheral modules |
| **6** | End clamp for DIN rail | For securing JX3 modules on the DIN rail |
| **7** | Voltage supply lines DC24V and 0V | Logic voltage supply for all modules of the JX3 station |

**Related Topics**

- **Limitations to be taken into account when engineering a JX3 station** on page 26

# Engineering of a JX3 Station equipped with JX3-BN-CAN

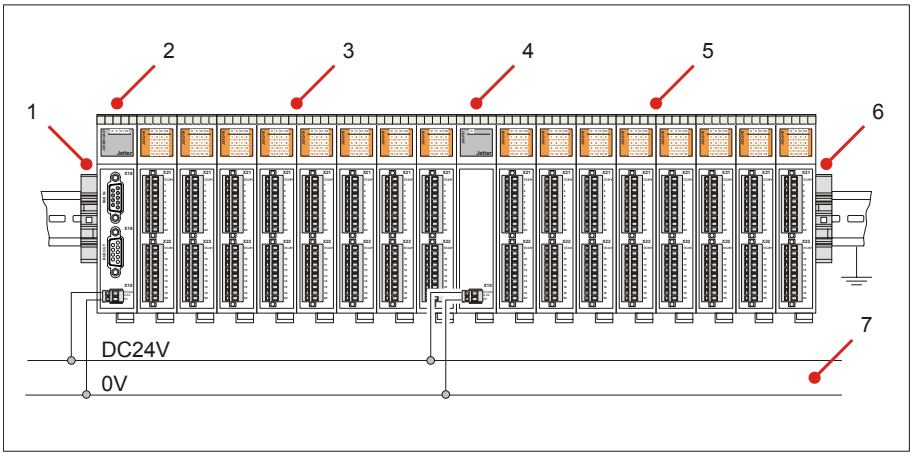
**Engineering Rules for a JX3 Station**

When engineering a JX3 station, follow the rules listed below:

- Up to 8 JX3 peripheral modules can directly be connected to a JX3-BN-CAN bus head.
- Before the ninth JX3 peripheral module, a JX3-PS1 power supply module must be inserted.
- To a JX3-PS1 power supply module up to 8 more JX3 peripheral modules can be connected.

**Fully Equipped JX3 Station**

The following illustration shows a JX3 station with a JX3-BN-CAN bus head and 16 JX3 peripheral modules. Downstream the eighth JX3 peripheral module a JX3-PS1 power supply module has been inserted.




| Number | Element | Function |
|---|---|---|
| **1** | End clamp for DIN rail | For securing JX3 modules on the DIN rail |
| **2** | JX3-BN-CAN | Bus head and power supply for the first 8 JX3 peripheral modules |
| **3** | JX3-DI16 | 8 JX3 peripheral modules |
| **4** | JX3-PS1 | Power supply module for the next 8 JX3 peripheral modules |
| **5** | JX3-DI16 | 8 JX3 peripheral modules |
| **6** | End clamp for DIN rail | For securing JX3 modules on the DIN rail |
| **7** | Voltage supply lines DC24V and 0V | Logic voltage supply for all modules of the JX3 station |

**Related Topics**

- **Limitations to be taken into account when engineering a JX3 station** on page 26

# Limitations to be Taken Into Account When Engineering a JX3 Station

**Introduction**

JX3 modules of a JX3 station are supplied with logic voltage either by a JC-3xx controller, or a JX3-BN-xxx bus head, or a JX3-PS1 power supply module. Each of these modules is able to supply up to 8 downstream JX3 modules with logic voltage.

Certain JX3 modules, however, have a higher power consumption which may reduce the number of connectable JX3 modules. Depending on the power consumption, the JX3 station has to be equipped with additional JX3-PS1 power supply modules.

**When does this Limitation Apply?**

When engineering a JX3 station, this limitation applies in the following cases:

- if a JX3-AO4 module is used for current output
- if a JX3-AO4 module with HW revision 01.xx is connected

**Allowed Power Consumption**

The following table shows the allowed power consumption of JX3 modules connected to the right (downstream) of the power supply module.

| Power Supply Module | Power Consumption $_{P24V}$ | Power Consumption $_{P5V}$ |
|---|---|---|
| JC-3xx | 18 W | 6 W |
| JX3-BN-ETH | 18 W | 6 W |
| JX3-BN-CAN | 22 W | 6 W |
| JX3-PS1 | 24 W | 6 W |

**Modules not to be Taken into Account**

The following JX3 modules are not taken into account when calculating power consumption:

- Controller JC-3xx
- Bus head JX3-BN-ETH
- Bus head JX3-BN-CAN
- Power supply module JX3-PS1

**Engineering Steps**

When engineering a JX3 Station, take the following steps:

| Step | Action |
|---|---|
| **1** | Determine the current consumption of JX3 modules given in the Technical Data of the JX3 backplane bus. |
| **2** | Calculate the power consumption of the JX3 modules. |
| **3** | Add the power consumption of JX3 modules included in the JX3 station. Start with the first JX3 module connected to the JC-3xx controller, or JX3-BN-xxx bus head. |
| **4** | Check whether the allowed power consumption has been exceeded. |

| Step | Action |
|---|---|
| 5 | |

| If ... | Then ... |
|---|---|
| the allowed 5 V power consumption has been reached | insert a JX3-PS1 power supply module upstream the next JX3 module |
| the allowed 24 V power consumption has been reached | insert a JX3-PS1 power supply module upstream the next JX3 module |
| 8 JX3 modules have been connected | insert a JX3-PS1 power supply module upstream the next JX3 module |
| 16 JX3 modules have been connected | the JX3 station is fully equipped |

**Power Consumption Calculation**

Calculate the power consumption of a JX3 module by the following formula:

$$P_{5V} = 5V \cdot I_{5V}$$
$$P_{24V} = 24V \cdot I_{24V} \cdot \frac{P_{5V}}{0.85}$$

| Element | Function |
|---|---|
| $I_{24\,V}$ | Current consumption - additional backplane voltage |
| $I_{5\,V}$ | Current consumption - logic backplane voltage |

**Example**

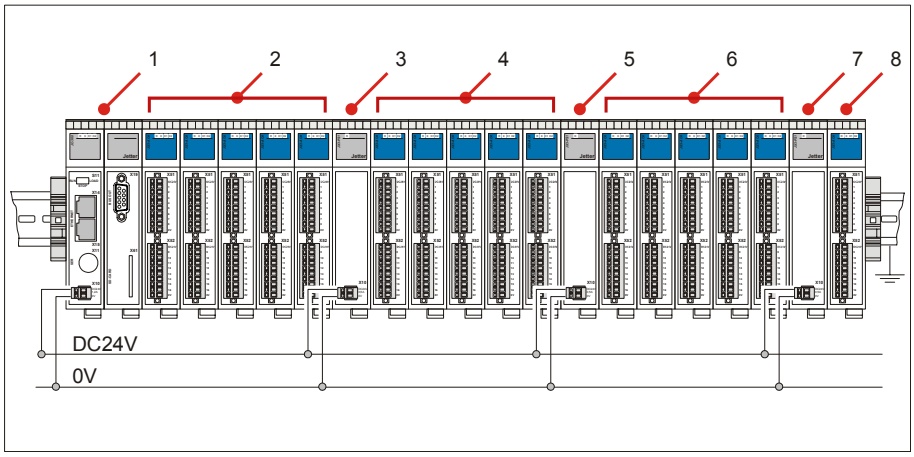
16 JX3-AO4 modules (HW revision 1.xx) are connected to a JC-3xx controller. The limitations to be taken into account when engineering a JX3 station apply to these JX3-AO4 modules.

| Step | Action |
|---|---|
| 1 | Determine the current consumption of JX3-AO4 modules given in the Technical Data:<br>■ Current consumption - logic backplane voltage: 220 mA<br>■ Current consumption - additional backplane voltage: 20 mA |
| 2 | Calculating the power consumption of a JX3-AO4 module:<br>$P_{5V} = 5V \cdot 220mA = 1.1W$<br>$P_{24V} = 24V \cdot 20mA = 1.77W$ |
| 3 | Add the power consumption of n JX3-AO4 modules:<br>$\sum P_{5V} = n \cdot P_{5V}$<br>$\sum P_{24V} = n \cdot P_{24V}$ |

| Step | Action |
|---|---|
| **4** | Checking the allowed power consumption:<br>**For JC-3xx:** $\sum P_{5V} \le 6W$, $\sum P_{24V} \le 18W$<br>**For JX3-PS1:** $\sum P_{5V} \le 6W$, $\sum P_{24V} \le 24W$ |
| **5** | The power consumption at 5V limits the number of JX3-AO4 modules:<br>$n = \frac{\sum P_{5V}}{P_{5V}} = \frac{6W}{1.1W} = 5.54 \Rightarrow 5$<br>Every 5 JX3-AO4 modules a JX3-PS1 power supply module must be inserted. |

**Engineering the JX3 Station mentioned in our Example**

Engineering of the JX3 station mentioned in our example which is equipped with 16 JX3-AO4 modules (HW revision 1.xx) is carried out as follows:




| Number | Element | Function |
|---|---|---|
| **1** | JC-3xx | Controller |
| **2** | JX3-AO4 | Modules 1 to 5 supplied by JC-3xx (1) |
| **3** | JX3-PS1 | Power Supply Module |
| **4** | JX3-AO4 | Modules 6 to 10 supplied by JX3-PS1 (3) |
| **5** | JX3-PS1 | Power Supply Module |
| **6** | JX3-AO4 | Modules 11 to 15 supplied by JX3-PS1 (5) |
| **7** | JX3-PS1 | Power Supply Module |
| **8** | JX3-AO4 | Module 16 supplied by JX3-PS1 (7) |

# 3 Locating Faults

**Purpose of this Chapter**

This chapter is for supporting you when locating faults of the JX3-PS1 module in the following fields of activity:

- Identifying the root cause of a fault
- Detecting a fault

**Prerequisites**

To be able to locate a fault of the JX3-PS1 module the following prerequisites have to be fulfilled:

- The module JX3-PS1 is part of a JX3 station.
- The module JX3-PS1 is supplied with power.

**Contents**

This chapter contains the following topics:


| Topic | Page |
|---|---|
| LED of the Module | 30 |
| Voltage is not OK | 31 |

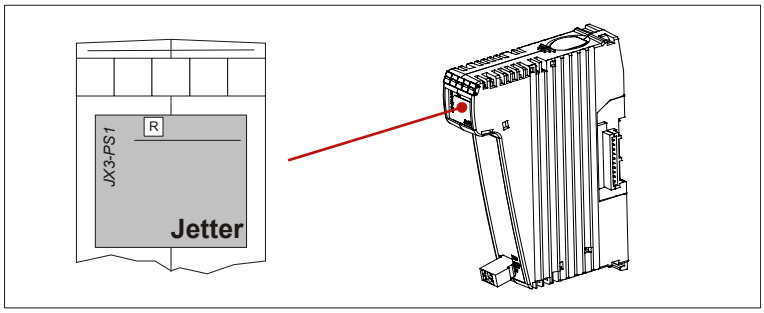
# LED of the Module

**Introduction**

The JX3-PS1 module signals via LED whether the logic voltage supply for connected JX3 peripheral modules is faultless. This feature allows the user to directly locate a fault.

**LED of the Module**

The JX3-PS1 module is equipped with an LED which indicates the condition of the supply voltage.




| Element | Status | Function |
|---|---|---|
| "R" LED | Off | Logic voltage supply for connected JX3 peripheral modules is not OK |
| | Green, lit | Logic voltage supply for connected JX3 peripheral modules is OK |

## Voltage is not OK

**Detecting the Fault**

The LED "R" of the JX3-PS1 module is only lit if all internally generated voltages are OK.

**Root Cause of Fault**

The fault may be caused by the following root causes:

- Defective hardware for internal voltage generation
- No voltage or undervoltage at terminal X10.DC24V

**Response of the Module to this Fault**

The module responds to this fault in the following levels:

| Level | Description |
|---|---|
| 1 | The LED "R" on the module goes out. |
| 2 | The LED "R" on all JX3 peripheral modules connected to the JX3-PS1 module goes out. |

**Fixing the Root Cause**

Carry out the following steps to fix the root cause:

| Step | Action |
|---|---|
| 1 | Check the voltage at terminal X10.DC24V. |
| 2 | <table><tr><th>If ...</th><th>Then ...</th></tr><tr><td>the voltage is below 20.4 V</td><td>ensure a sufficient voltage supply</td></tr><tr><td>the voltage is between 20.4 V and 28.8 V</td><td>a hardware fault has occurred.<br>Send the JX3-PS1 module to Jetter AG for repair</td></tr></table> |

**Resetting the Fault**

It is not possible to reset this fault.

# 4 Identifying the Module

**Purpose of this Chapter**

This chapter is for supporting you when identifying the JX3-PS1 module in the following fields of activity:

- Determining the revision of this module.

**Contents**

This chapter contains the following topics:


| Topic | Page |
|---|---|
| Identification via nameplate | 34 |

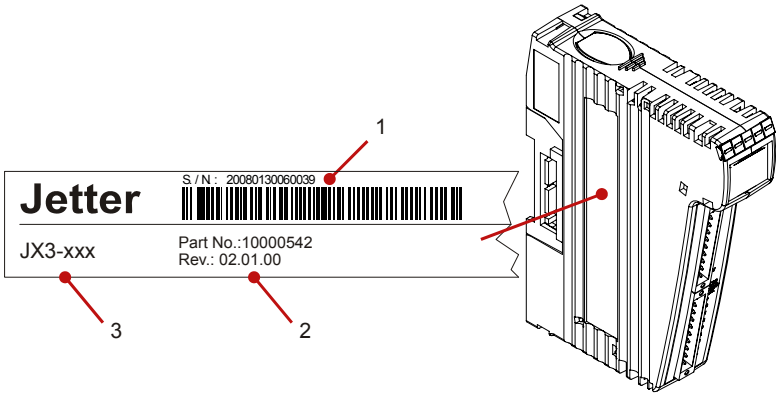
## Identification via nameplate

**Introduction**

Each JX3 module can be identified by its nameplate attached to its enclosure. You will need the hardware revision data if you have to contact the hotline of Jetter AG in case of a problem.

**Nameplate**

The nameplate of JX3 modules contains the following information:




| Number | Element |
|---|---|
| **1** | Serial number |
| **2** | Hardware revision |
| **3** | Module name |

# Appendix

**Introduction**

This appendix contains electrical and mechanical data, as well as operating data.

**Contents**

This appendix contains the following topics:


| Topic | Page |
|---|---|
| Technical Data | 36 |

# A: Technical Data

**Introduction**

This section of the appendix contains both electrical and mechanical data, as well as operating data of the JX3-PS1 module.

**Contents**

This chapter contains the following topics:


| Topic | Page |
|---|---|
| Technical Data | 37 |
| Physical Dimensions | 38 |
| Operating Parameters: Environment and Mechanics | 39 |
| Operating Parameters: Enclosure | 40 |
| DC Power Supply Inputs and Outputs | 41 |
| Shielded Data and I/O Lines | 42 |

# Technical Data

### Electrical Data: Power Supply

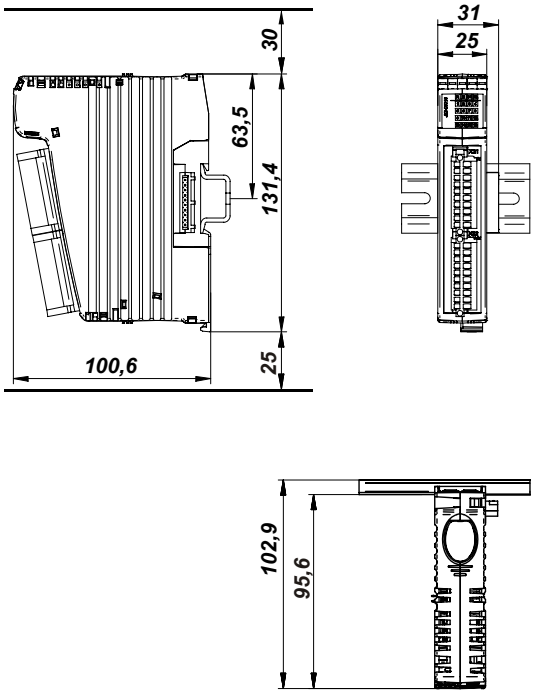
| Parameter | Value |
|---|---|
| Rated voltage | DC 24 V |
| Permissible voltage range | -15 % ... +20 % |
| Input current | max. 1.0 A |
| Power consumption | max. 24 W |

### Characteristics: JX3 Backplane Bus

| Parameter | Value |
|---|---|
| Logic voltage of backplane | DC +5 V (-15 % ... +10 %) |
| Current consumption of connected JX3 modules supplied by logic voltage of backplane | $I_{5V}$ = max. 1,200 mA |
| Power consumption of connected JX3 modules supplied by logic voltage of backplane | max. 6 W |
| Additional voltage of backplane | DC +24 V (-15 % ... +20 %) |
| Current consumption of connected JX3 modules supplied by additional backplane voltage | $I_{24V}$ = max. 1,000 mA |
| Power consumption of connected JX3 modules supplied by additional backplane voltage | max. 24 W |
| Power consumption of connected JX3 modules supplied by power supply voltage from JX3-PS1 module. | $24\text{V} \cdot I_{24\text{V}} + \frac{5\text{V} \cdot I_{5\text{V}}}{0.85} \leq 24\text{W}$ |
| Nominal power absorbed from the JX3 backplane bus | 0 W<br>The JX3-PS1 module provides JX3 modules with logic and additional voltage. |

# Physical Dimensions

## Physical Dimensions




**Minimum Clearances**

At mounting the JX3-PS1 module, make sure to maintain a minimum clearance above and below. At replacing the module, you can operate the locking mechanisms of the JX3 backplane module using your fingers.

- Minimum clearance above: 30 mm
- Minimum clearance below: 25 mm

**Module Width**

The JX3-PS1 module requires a space of 31 mm width. At connecting the JX3-PS1 module to a JX3 station, the width is increased by 25 mm.

**Mounting Position**

The mounting position of the JX3-PS1 module is vertical.

# Operating Parameters: Environment and Mechanics

### Environment

| Parameter | Value | Standard |
|---|---|---|
| Operating temperature range | 0 ... +50 °C | |
| Storage temperature range | -40 ... +70 °C | DIN EN 61131-2<br>DIN EN 60068-2-1<br>DIN EN 60068-2-2 |
| Air humidity | 10 ... 95 %,<br>non-condensing | DIN EN 61131-2 |
| Pollution degree | 2 | DIN EN 61131-2 |
| Corrosion /<br>Chemical resistance | No special protection against corrosion. Ambient air must be free from higher concentrations of acids, alkaline solutions, corrosive agents, salts, metal vapors, or other corrosive or electroconductive contaminants | |
| Max. operating altitude | 2,000 m above sea level | DIN EN 61131-2 |

### Mechanical Parameters

| Parameter | Value | Standard |
|---|---|---|
| Free falls withstanding test | Free fall at<br>Shipping packaging: 1 m<br>Product packaging: 0.3 m | DIN EN 61131-2<br>DIN EN 60068-2-32 |
| Vibration resistance | 5 Hz - 9 Hz: 3.5 mm amplitude<br>9 Hz - 150 Hz : 1 g acceleration:<br>1 octave/minute, 10 frequency sweeps (sinusoidal), all 3 spatial axes | DIN EN 61131-2<br>DIN EN 60068-2-6 |
| Shock resistance | 15 g occasionally, 11 ms, sinusoidal half-wave, 3 shocks in the directions of all three spatial axes | DIN EN 61131-2<br>DIN EN 60068-2-27 |
| Degree of protection | IP 20 | DIN EN 60529 |
| Mounting position | Vertical position, snapped on DIN rail | |

# Operating Parameters: Enclosure

### Electrical Safety

| Parameter | Value | Standard |
|---|---|---|
| Protection class | III | DIN EN 61131-2 |
| Dielectric test voltage | Functional ground is connected to chassis ground internally. | DIN EN 61131-2 |
| Protective connection | 0 | DIN EN 61131-2 |
| Overvoltage category | II | DIN EN 61131-2 |

### EMC - Emitted Interference

| Parameter | Value | Standard |
|---|---|---|
| Enclosure | Frequency band 30 - 230 MHz, limit 30 dB (µV/m) in 10 m<br>Frequency band 230 - 1,000 MHz, limit 37 dB (µV/m) in 10 m<br>(class B) | DIN EN 61000-6-3<br>DIN EN 61000-6-4<br>DIN EN 55011 |

### EMC - Immunity to Interference

| Parameter | Value | Standard |
|---|---|---|
| Magnetic field with mains frequency | 50 Hz<br>30 A/m | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-8 |
| RF field, amplitude-modulated | Frequency band 80 MHz - 2 GHz<br>Test field strength: 10 V/m<br>AM 80 % at 1 kHz<br>Criterion A | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-3 |
| ESD | Discharge through air: Test peak voltage 8 kV<br>Contact discharge: Test peak voltage 4 kV<br>Criterion A | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-2 |

# DC Power Supply Inputs and Outputs

### EMC - Emitted Interference

| Parameter | Value | Standard |
|---|---|---|
| Signal and control interface<br>DC power supply inputs and outputs | Frequency bands:<br>0.15 to 0.5 MHz, limit 40 to 30 dB<br>0.5 to 30 MHz, limit 30 dB<br>(class B) | DIN EN 61000-6-3 |

### EMC - Immunity to Interference

| Parameter | Value | Standard |
|---|---|---|
| RF, asymmetric | Frequency band 0.15 – 80 MHz<br>Test voltage 3 V<br>AM 80 % at 1 kHz<br>Source impedance 150 Ohm<br>Criterion A | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-6 |
| Bursts | Test voltage 2 kV<br>tr/tn 5/50 ns<br>Repetition frequency 5 kHz<br>Criterion A | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-4 |
| Voltage surges,<br>asymmetric (line to earth),<br>symmetrical (line to earth) | tr/th 1.2/50 µs<br>Common-mode interference voltage 1 kV<br>Series-mode interference voltage 0.5 kV | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-5 |

# Shielded Data and I/O Lines

### EMC - Immunity to Interference

| Parameter | Value | Standard |
|---|---|---|
| Asymmetric RF, amplitude-modulated | Frequency band 0.15 – 80 MHz<br>Test voltage 3 V<br>AM 80 % at 1 kHz<br>Source impedance 150 Ohm<br>Criterion A | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-6 |
| Bursts | Test voltage 1 kV<br>tr/tn 5/50 ns<br>Repetition frequency 5 kHz<br>Criterion A | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-4 |
| Voltage surges, asymmetric<br>(line to earth) | tr/th 1.2/50 µs<br>Common-mode interference voltage 1 kV | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-5 |

### EMC - Interference Immunity of Functional Earth Connections

| Parameter | Value | Standard |
|---|---|---|
| RF, asymmetric | Frequency band 0.15 – 80 MHz<br>Test voltage 3 V<br>AM 80 % at 1 kHz<br>Source impedance 150 Ohm<br>Criterion A | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-6 |
| Bursts | Test voltage 1 kV<br>tr/tn 5/50 ns<br>Repetition frequency 5 kHz<br>Criterion A | DIN EN 61131-2<br>DIN EN 61000-6-2<br>DIN EN 61000-4-4 |

# B: Index


## C

Components of JX3-PS1 • 17

## D

Decommissioning • 10

## E

EMC
  Remarks • 13

## F

Faults
  Voltage is not OK • 31

## I

Intended Conditions of Use • 10

## L

LED • 22
List of Documentation • 18

## M

Modifications • 10

## O

Operating Parameters
  DC Power Supply Inputs and Outputs • 41
  Enclosure • 40
  Environment and Mechanics • 39
  Shielded Data and I/O Lines • 42

## P

Physical Dimensions • 19
Product Description • 16

## Q

Qualified Staff • 10

## R

Repair • 10
Replacing Modules • 10
Representation of Safety Information • 5

## S

Safety Instructions • 9
Scope of Delivery • 16

## T

Technical Data • 37
Terminal X10 • 20
Transport • 10

## U

Usage other than intended • 10

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